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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RICHARD A. PITTNER, ANDREW A. YOUNG,
and JAMES R. PATERNITI, JR.

Appeal 2009-003066
Application 10/016,969
Technology Center 1600

Decided: January 15, 2010

Before DONALD E. ADAMS, ERIC GRIMES, and
RICHARD M. LEBOVITZ, *Administrative Patent Judges*.

ADAMS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal under 35 U.S.C. § 134 involves claims 33, 43-47, 51, and 54-73, the only claims pending in this application (App. Br. 2). We have jurisdiction under 35 U.S.C. § 6(b).

STATEMENT OF THE CASE

"A number of related hormones make up the pancreatic polypeptide (PP) family" (Spec. 1: 21-22). PP "is a 36-amino acid peptide [SEQ ID NO.: 1] containing distinctive structural motifs" (Spec. 1: 22-25 (alteration original)). Peptide YY (PYY) has the sequence set forth in SEQ ID NO.: 2 and is related to PP (Spec. 1: 25-26). Neuropeptide Y (NPY) has the sequence set forth in SEQ ID NO.: 4 and is also related to PP.

"Pharmacological studies and cloning efforts have revealed a number of seven transmembrane receptors for the PP family of peptides, and these receptors have been assigned the names Y1 through Y6 (and a putative PYY-preferring receptor or Y7)" (Spec. 3: 15-17).

Appellants disclose that the "peripheral administration of PYY and PYY agonists reduces nutrient availability and is useful in the treatment of obesity and related disorders" (Spec. 5: 12-15).

The claims are directed to a method of reducing food intake (claims 33, 43, 44, 47, 51, 54-57, 59-63, 65, and 69-73); a method of reducing appetite (claims 33, 45, 46, 47, 51, 54, 59-63, 67, and 71-73); a method of reducing nutrient availability (claims 33, 58-63, 66, and 71-73); a method of reducing caloric efficiency (claims 33, 59-64, and 71-73); and a method of reducing weight, reducing weight gain, or increasing weight loss (claims 33, 59-63, 68, and 71-73). Claims 33, 43, and 73 are illustrative:

33. The method of any one of claims 43 to 46, 55 to 58, and 64 to 69, wherein the PYY agonist analog has a potency in at least one food intake or gastric emptying assay greater than NPY.

43. A method of reducing food intake comprising peripherally administering to a human subject, via a parenteral route, an amount

of PYY agonist analog effective to reduce food intake, wherein the PYY agonist analog is a peptide which does not comprise YP as its first two consecutive N-terminal amino acids, wherein the PYY agonist analog elicits a pharmacological effect at a Y2, Y5 or Y7 receptor greater than that of PYY[1-36] at a Y1 receptor, and wherein the amount comprises about 5 μg to 100 μg per day in a single or divided dose.

73. The method of any one of claims 43-46, 55-58, and 64-69, wherein the pharmacological effect at the Y1 receptor is an increase in blood pressure.

The Examiner relies on the following evidence:

McFadden	U.S. 5,574,010	Nov. 12, 1996
Balasubramaniam ('203)	U.S. 5,604,203	Feb. 18, 1997
Tseng	U.S. 5,696,093	Dec. 9, 1997
Balasubramaniam	U.S. 6,046,167	Apr. 4, 2000

John E. Morley, et al., *An Investigation of Tolerance to the Actions of Leptogenic and Anorexigenic Drugs in Mice*, 41 Life Sci. 2157-2165 (1987).

Keigo Yoshinaga, et al., *Structural requirements of peptide YY for biological activity at enteric sites*, 263 Am. J. Physiol. G695-G701 (1992).

S. Okada, et al., *Peripherally not Centrally Administered Peptide YY(PYY) Decreases High Fat Diet Intake,* The Endocrine Society 75th Annual Meeting Program & Abstract, 180: 520B (1993).

The rejections presented by the Examiner follow[1]:

1. Claims 33, 43-46, 51, and 54-73 stand rejected under the written description provision of 35 U.S.C. § 112, first paragraph.

2. Claim 73 stands rejected under the written description provision of 35 U.S.C. § 112, first paragraph as containing new matter.

3. Claims 33, 43-46, 51, and 54-73 stand rejected under the enablement provision of 35 U.S.C. § 112, first paragraph.

We affirm.

Written Description:

ISSUE

Have Appellants established error in the Examiner's finding that Appellants' Specification lacks written descriptive support for the claimed invention?

FINDINGS OF FACT

FF 1. Appellants define the term "PYY" as a polypeptide that is "obtained or derived from any species . . . [and] includes both the human full length,

[1] The Examiner entered Appellants' after final amendment and withdrew the objection to claim 73 (Ans. 2). The Examiner withdrew the prior art rejection and the rejection of claims 33, 43-47, 51, 54-72 under 35 U.S.C. § 112, second paragraph (Ans. 3). Claim 47 is free from rejection. Nevertheless, the Examiner objected to claim 47 "as being dependent upon a rejected base claim" and indicated that claim 47 "would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims" (Ans. 2). The objection to claim 47 is a petitionable matter. Therefore, the objection to claim 47 was not considered as part of our deliberations in this Appeal.

36 amino acid peptide as set forth in SEQ ID NO: 2, and species variations of PYY, including e.g., murine, hamster, chicken, bovine, rat, and dog PYY" (Spec. 5: 21-24).

FF 2. Appellants define the term "PYY agonist" as:

> [A]ny compound which elicits an effect of PYY to reduce nutrient availability, for example a compound (1) having activity in the food intake, gastric emptying, pancreatic secretion, or weight loss assays described herein in Examples 1, 2, 5, or 6 and (2) which binds specifically in a Y receptor assay (Example 10) or in a competitive binding assay with labeled PYY or PYY[3-36] from certain tissues having an abundance of Y receptors, including e.g., area postrema (Example 9), wherein the PYY agonist is not pancreatic polypeptide.

(Spec. 5: 24-30.)

FF 3. The Examiner finds that while the claims limit the:

> PYY agonist analog to a peptide and exclud[e] YP from the first two consecutive N-terminal amino acids, do not provide any structural feature of the genus of PYY agonist analogs, do not represent a meaningful functional limitation for the PYY agonist analogs, and say nothing about the actual structure of a PYY agonist analog. Thus, the claims do not require that the PYY agonist analogs possess any particular biological activity, nor any particular conserved structure, nor other disclosed distinguishing feature. Consequently, the claims are drawn to a method of reducing food intake, appetite, caloric efficiency, weight, weight gain or increasing weight loss comprising peripherally administering to a subject of a PYY agonist analog with undefined structure and functional activity.

(Ans. 12; *see also* Ans. 23.)

FF 4. Appellants disclose that the PYY:

> [A]gonists can comprise a polypeptide having a functional PYY domain, an active fragment of PYY, or a chemical or small

> molecule. PYY agonists may be peptide or non-peptide compounds, and include "PYY agonist analogs," which refer to any compound structurally similar to a PYY that have PYY activity typically by virtue of binding to or otherwise directly or indirectly interacting with a PYY receptor or other receptor or receptors with which PYY itself may interact to elicit a biological response. Such compounds include derivatives of PYY, extended PYY molecules having more than 36 amino acids, truncated PYY molecules having less than 36 amino acids, and substituted PYY molecules having one or more different amino acids, or any combination of the above. Such compounds may also be modified by processes such as amidation, glycosylation, acylation, sulfation, phosphorylation, acetylation and cyclization.

(Spec. 6: 3-13; *see also* Ans. 11.)

FF 5. The Examiner finds that Appellants':

> [S]pecification does not provide any structural characteristics to adequately describe the genus of PYY agonist analogs that may be administered in the claimed method. There is no defined relation[ship] between function and structure of the PYY agonist analogs. There is . . . no identification of any particular portion of the structure that must be conserved.

(Ans. 12-13.)

FF 6. Appellants disclose that "[a] PYY agonist may bind to a PYY receptor with higher or lower affinity, demonstrate a longer or shorter half-life *in vivo* or *in vitro*, or be more or less effective than native PYY" (Spec. 6: 17-19).

FF 7. The Examiner finds that Appellants':

> [S]pecification discloses screening for PYY agonists using receptor-binding assays (Examples 9 and 10; page 15 of specification). The assays measure the binding of different test compounds toward a specific receptor (see, e.g., Table 1).

> However, the limitation recited in the instant claims requires comparison of two varying factors: the PYY agonist analog elicits a pharmacological effect at a Y2, Y5 or Y7 receptor greater than that of PYY[1-36] at a Y1 receptor. The specification does not describe an assay that can be readily used for one of skill in the art to identify whether the PYY agonist analog elicits a pharmacological effect at a Y2, Y5 or Y7 receptor greater than that of PYY[1-36] at a Y1 receptor. Moreover, as disclosed in the specification (lines 10-17 of page 17; lines 5-8 of page 19), the pharmacological effect of a test compound on a Y receptor is not an indicator of potency of PYY-related compounds in reducing food intake and gastric emptying.

(Ans. 13; *see also* Ans. 23-24 and 27-28.)

FF 8. The Examiner finds that:

> [T]he general teaching that PYY analogs may be made by, e.g., conservative amino acid substitution of the sequence of PYY or portion thereof does not provide specific guidance to make the genus of PYY agonist analogs used in the claimed methods because the specification does not disclose the conserved structure that is critical for reducing food intake and gastric emptying.

(Ans. 26.)

FF 9. The Examiner finds that "the skilled artisan cannot envision the detailed chemical structure of the encompassed genus of the PYY agonist analogs" (Ans. 15; *see also* Ans. 24 (Appellants' claims "encompass a genus of PYY agonist analogs without defined structure and function")).

FF 10. The Examiner finds that Appellants' disclosure of "two compounds, a human PYY of SEQ ID NO: 2 and PYY (3-36) of SEQ ID NO: 3 (page 12), which may be administered in the claimed method . . . [is] not sufficiently representative of the claimed genus of PYY agonists" (Ans. 12).

FF 11. The Examiner finds that:

> [T]he prior art does not provide teachings for the broad genus of PYY agonist analogs. U.S. Patent Nos: 5,574,010, 5,604,203, 5,696,093, and 6,046,167 describe PYY agonists. However, these U.S. Patents do not teach the PYY agonists in the context of reducing nutrient availability, food intake or body weight. The PYY agonists [of the prior art] were taught for entirely different purposes. . . . Moreover, the agonists are determined based upon the competitive binding assay in the presence of ^{125}I-PYY. An antagonist may bind the PYY receptor; but it does not make the antagonist a PYY agonist.

(Ans. 14; *see also* Ans. 25-26.)

PRINCIPLES OF LAW

"The 'written description' requirement [under 35 U.S.C. § 112, first paragraph] implements the principle that a patent must describe the technology that is sought to be patented; the requirement serves both to satisfy the inventor's obligation to disclose the technologic knowledge upon which the patent is based, and to demonstrate that the patentee was in possession of the invention that is claimed." *Capon v. Eshhar*, 418 F.3d 1349, 1357 (Fed. Cir. 2005).

An adequate written description of a chemical invention "requires a precise definition, such as by structure, formula, chemical name, or physical properties." *University Of Rochester v. G.D. Searle & Co., Inc.*, 358 F.3d 916, 927 (Fed. Cir. 2004); *Regents of the Univ. of Cal. v. Eli Lilly & Co.*, 119 F.3d 1559, 1566 (Fed. Cir. 1997); *Fiers v. Revel*, 984 F.2d 1164, 1171 (Fed. Cir. 1993). In this regard, "the written description requirement can be met by 'show[ing] that an invention is complete by disclosure of sufficiently detailed, relevant identifying characteristics . . . *i.e.*, complete or partial

structure, other physical and/or chemical properties, *functional characteristics when coupled with a known or disclosed correlation between function and structure*, or some combination of such characteristics.'" *Enzo Biochem, Inc. v. Gen-Probe Inc.*, 323 F.3d 956, 964 (Fed. Cir. 2002).

"A description of what a material does, rather than of what it is, usually does not suffice." *Rochester*, 358 F.3d at 923; *Eli Lilly*, 119 F.3d at 1568. Instead, the "disclosure must allow one skilled in the art to visualize or recognize the identity of the subject matter purportedly described." *Id.* In addition, possession of a genus "may be achieved by means of a recitation of a representative number of [compounds] … falling within the scope of the genus." *Eli Lilly*, 119 F.3d at 1569. "Possession may not be shown by merely describing how to obtain possession of members of the claimed genus." *Ex parte Kubin*, 83 USPQ2d 1410, 1417 (BPAI 2007) (citing *Rochester*, 358 F.3d at 927).

Arguments not made are waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

ANALYSIS

The claims have not been argued separately and therefore stand or fall together. 37 C.F.R. § 41.37(c)(1)(vii). Claim 43 is representative. Claim 43 is drawn to a method of reducing food intake. The claimed method comprises peripherally administering to a human subject, via a parenteral route, an amount of PYY agonist analog effective to reduce food intake. Claim 43 requires the PYY agonist:

a. to be a peptide which does not comprise YP as its first two consecutive N-terminal amino acids, and

b. elicit a pharmacological effect at a Y2, Y5 or Y7 receptor greater than that of PYY[1-36] at a Y1 receptor.

In addition, claim 43 defines the amount of PYY agonist analog effective to reduce food intake as comprising about 5 μg to 100 μg per day in a single or divided dose.

According to Appellants' Specification "'PYY agonist analogs' refer to any compound structurally similar to a PYY that has PYY activity typically by virtue of binding to or otherwise directly or indirectly interacting with a PYY receptor or other receptor or receptors with which PYY itself may interact to elicit a biological response" (FF 4; App. Br. 8).

Therefore, the method of claim 43 requires the parenteral administration of an amount comprising about 5 μg to 100 μg per day in a single or divided dose of a peptide that:

1. does not comprise YP as its first two consecutive N-terminal amino acids,
2. is structurally similar to a PYY, and
3. exhibits PYY activity by *binding to or otherwise directly or indirectly interacting with a PYY receptor* or *other receptor or receptors* with which PYY itself may interact to elicit a biological response *as long as* the analog elicits a pharmacological effect at a Y2, Y5 or Y7 receptor that is greater than the effect PYY[1-36] elicits at a Y1 receptor.

From the foregoing it is clear that claim 43 does not require the PYY agonist analog to bind a Y2, Y5, or Y7 receptor. To the contrary, while the PYY agonist analog may be structurally similar to a PYY, the analog of

claim 43 may exert its effect by indirectly interacting with a PYY Y2, Y5, or Y7 receptor.

Appellants' Specification does not define the phrase "structurally similar to a PYY" (*see* FF 4). At best, Appellants disclose that PYY analogs:

> [*I*]*nclude* derivatives of PYY, extended PYY molecules having more than 36 amino acids, truncated PYY molecules having less than 36 amino acids, and substituted PYY molecules having one or more different amino acids, or any combination of the above. Such compounds may also be modified by processes such as amidation, glycosylation, acylation, sulfation, phosphorylation, acetylation and cyclization.

(*id.* (emphasis added); App. Br. 8.) Accordingly, while PYY agonist analogs may *include* the foregoing compounds they may also *include* a host of other undefined peptides that are capable of binding or otherwise eliciting a direct or indirect effect on a PYY Y2, Y5, or Y7 receptor.

Accordingly, we find no error in the Examiner's finding that Appellants':

> [S]pecification does not provide any structural characteristics to adequately describe the genus of PYY agonist analogs that may be administered in the claimed method. There is no defined relation[ship] between function and structure of the PYY agonist analogs. There is . . . no identification of any particular portion of the structure that must be conserved.

(FF 5.)

Appellants contend that "for biomolecules, receptor specificity can be used to meet the written description requirement" (App. Br. 7). In this regard, Appellants contend that the PYY agonist analogs "are structurally similar to PYY, and, *e.g.,* interact with a PYY receptor" (App. Br. 9). We

are not persuaded. As discussed above, there is no requirement in claim 43 that the PYY agonist analog exhibit specificity for a Y2, Y5, or Y7 receptor. To the contrary, claim 43 permits the PYY agonist analog to exhibit specificity for something other than a Y2, Y5, or Y7 receptor that indirectly affects a Y2, Y5, or Y7 receptor.

Similarly, we are not persuaded by Appellants' contention that "those skilled in the art are routinely able to compare the effects of PYY molecules at different receptors" (App. Br. 9). Appellants have failed to identify a disclosure in their Specification that describes the structure of the genus of PYY agonist analogs that indirectly affect a Y2, Y5, or Y7 receptor as required by Appellants' claimed invention.

Appellants contend that PYY agonist analogs were generally known at the time of filing (App. Br. 8). In this regard, Appellants direct attention to Example 2 of their Specification which refers to Balasubramaniam (*id.*). We are not persuaded. Appellants fail to establish that Balasubramaniam teaches structures of PYY agonist analogs as defined by Appellants' Specification (*see* FF 4) and having the claimed pharmacological effects.

Appellants contend that their Specification teaches "that PYY analogs may be made by, *e.g.*, conservative amino acid substitution of the sequence of PYY or portions thereof, and can be tested in the assays provided in the Examples or other suitable assays that distinguish the actions of PYY from those of NPY or PP" (App. Br. 8). In addition, Appellants contend that "the specification provides extensive guidance regarding Y receptor preferences (Table 1) and related screening assays (Examples 9 and 10)" (Reply Br. 5). We are not persuaded. Appellants' contention does not address the requirements of the written description provision of 35 U.S.C. § 112, first

paragraph. *See, e.g., Rochester*, 358 F.3d at 923; *Eli Lilly*, 119 F.3d at 1568-1569; *Ex parte Kubin*, 83 USPQ2d at 1417.

CONCLUSION OF LAW

Appellants failed to establish error in the Examiner's conclusion that Appellants' Specification lacks written descriptive support for the claimed invention. The rejection of claim 43 under the written description provision of 35 U.S.C. § 112, first paragraph is affirmed. Claims 33, 44-46, 51, and 54-73 fall together with claim 43.

New Matter:

ISSUE

Have Appellants established error in the Examiner's conclusion that Appellants' Specification lacks written descriptive support for the claimed invention?

FINDINGS OF FACT

FF 12. The Examiner finds that Appellants' Specification fails to provide written descriptive support for the phrase "wherein the pharmacological effect at the Y1 receptor is an increase in blood pressure" as it appears in claim 73 (Ans. 16).

FF 13. Example 5 of Appellants' Specification discloses that "PYY[3-36] administered by acute peripheral (subcutaneous) injection at 30μg/kg blocked CCK-8-stimulated pancreatic secretion in rats as measured by amylase activity in pancreatic juice" (Spec. 22: 5-7).

FF 14. Appellants' disclosure of the Y1 receptor as it appears in Table 1 (Spec. 10) is reproduced below:

Y1	NPY = PYY > NPY[3-36] = PYY[3-36] = PP	(Iyengar, S., Li, D. L., and Simmons, R. M. *J Pharmacol Exp Ther* 289: 1031-40, 1999) (Gehlert, D. R. *Proc Soc Exp Biol Med* 218: 7-22, 1998;Michel, M. C., Beck-Sickinger, A., Cox, H., Doods, H. N., Herzog, H., Larhammar, D., Quirion, R., Schwartz, T., and Westfall, T. *Pharmacol Rev* 50: 143-50, 1998) US 5,968,819

PRINCIPLES OF LAW

> In order to satisfy the written description requirement, the disclosure as originally filed does not have to provide *in haec verba* support for the claimed subject matter at issue. Nonetheless, the disclosure must . . . convey with reasonable clarity to those skilled in the art that . . . [the inventor] was in possession of the invention. Put another way, one skilled in the art, reading the original disclosure, must immediately discern the limitation at issue in the claims. That inquiry is a factual one and must be assessed on a case-by-case basis.

Purdue Pharma L.P. v. Faulding, Inc., 230 F.3d 1320, 1323 (Fed. Cir. 2000) (citations omitted) (alterations in original).

> Incorporation by reference provides a method for integrating material from various documents into a host document . . . by citing such material in a manner that makes clear that the material is effectively part of the host document as if it were explicitly contained therein. To incorporate material by reference, the host document must identify *with detailed particularity* what specific material it incorporates and *clearly indicate where* that material is found in the various documents.

Advanced Display Systems, Inc. v. Kent State University, 212 F.3d 1272, 1282-83 (Fed. Cir. 2000) (citations omitted) (emphasis added).

Argument by counsel cannot take the place of evidence. *In re Cole*, 326 F.2d 769, 773 (CCPA 1964); *In re Geisler*, 116 F.3d 1465, 1471 (Fed. Cir. 1997).

Arguments not made are waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

ANALYSIS

Claim 73 depends from and further limits, *inter alia*, claim 43, to require that the pharmacological effect of PYY[1-36] at a Y1 receptor is an increase in blood pressure. The Examiner finds that Appellants' Specification fails to provide written descriptive support for the claimed pharmacological effect (FF 12).

Appellants contend that "Example 5" of their Specification "clearly cites measurement of blood pressure" (App. Br. 10). We are not persuaded. Appellants failed to establish that the "measurement of blood pressure" in the context of Example 5 of their Specification is related to "the pharmacological effect of PYY[1-36] at a Y1 receptor" (*see* FF 13).

Appellants contend that the Gehlert reference cited in Table 1 of their Specification supports the proposition that "it was known in the art at [t]he time of filing that the Y1 receptor mediates vasoconstriction and blood pressure increase" (App. Br. 10). We are not persuaded.

Appellants failed to identify a disclosure in their Specification that incorporates subject matter from the Gehlert reference with detailed particularity, clearly indicating where that material is found in the document. *Advanced Display Systems, Inc. v. Kent State University*, 212 F.3d at 1282-83. In this regard, while Appellants' Specification clearly identifies the Gehlert reference, it fails to identify Gehlert as teaching a relationship

between blood pressure and PYY[1-36]'s effect on the Y1 receptor. Appellants' Specification also fails to direct attention to page 10, col. 1 and page 14, col. 2 of the Gehlert reference. Accordingly, we are not persuaded by Appellants' contention that "one of skill in the art would understand the inventors to be in possession of measurement of blood pressure as a pharmacological effect, and measurement of that effect at the Y1 receptor" (App. Br. 10).

CONCLUSION OF LAW

Appellants failed to establish error in the Examiner's conclusion that Appellants' Specification lacks written descriptive support for the claimed invention. The rejection of claim 73 under the written description provision of 35 U.S.C. § 112, first paragraph as containing new matter is affirmed.

Enablement:

ISSUE

Have Appellants established error in the Examiner's prima facie case of lack of enablement?

FINDINGS OF FACT

FF 15. The Examiner finds that Appellants have broadly defined PYY agonist analogs within the scope of the claimed invention (Ans. 5-6; *see also* FF 1-6, 9, and 11).

FF 16. The Examiner finds that Appellants' disclosure of two compounds, a human PYY of SEQ ID NO: 2 and PYY (3-36) of SEQ ID NO: 3 (page 12),

which may be administered in the claimed method is not sufficiently representative of the claimed genus of PYY agonists (Ans. 6).

FF 17. The Examiner finds that while the prior art teaches that the "peripheral administration of PYY or PYY[3-36] inhibits pancreatic exocrine and gastric acid output in mongrel dogs . . ., reduces body weight in 12-week-old mice . . ., and reduces high fat diet intake in male Sprague-Dawley rats" the prior art fails to teach that these effects can be obtained from the broad genus of PYY agonist analogs set forth in Appellants' claims (Ans. 7).

FF 18. The Examiner finds that while U.S. Patent Nos. 5,574,010; 5,604,203; 5,696,093; and 6,046,167 describe PYY agonists, "these U.S. Patents do not teach the PYY agonists in the context of reducing nutrient availability, food intake or body weight" (*id.*).

FF 19. The Examiner finds that Appellants' Specification "fails to provide the conserved structure that is critical for the function of PYY agonist analogs and fails to provide sufficient guidance on how to make such PYY agonist analogs used in the instantly claimed methods" (Ans. 8). *See also* Ans. 16-17 ("[n]o specific guidance and working examples are provided in the specification to guide one skilled in the art to make such a genus of PYY agonist analogs and to use the claimed methods").

FF 20. The Examiner finds that while Appellants' Specification discloses assays that "measure the binding of different test compounds toward a specific receptor"; Appellants' Specification also discloses that "the pharmacological effect of a test compound on a Y receptor is not the indicator of potency of PYY-related compounds in reducing food intake and gastric emptying" (*id.*).

FF 21. The Examiner finds that "[i]n the absence of teachings on the structure that is critical for the function of the PYY agonist analogs, it would require [a] large quantity of experimentation to screen for such a PYY agonist analog that could be used in the claimed methods" (Ans. 9).

FF 22. The Examiner finds that while PYY(6-36) and PYY(13-36) are closely related to PYY, they "do not inhibit gastric acid secretion or pancreatic exocrine secretion" when peripherally administered (*id.*).

FF 23. Appellants' Specification discloses that:

> Applicant's [sic] data demonstrate that the effects of peripherally-administered PYY or PYY[3-36] to reduce food intake and to delay gastric emptying are determined by interactions with one or more unique receptor classes in, or similar to, those in the Y-fold family. The data are best explained by interactions with a receptor or receptors similar to the PYY-preferring (or Y7) receptors, and are less well explained by interactions with the other known Y receptors such as Y1-Y6.

(Spec. 9: 26 - 10: 1; *see also* published Spec. at ¶ [0033].)

FF 24. Appellants' Specification discloses that "[a]ny PYY or PYY agonist may be useful in the invention" (Spec. 11: 2; *see also* published Spec. at ¶ [0034]).

FF 25. Appellants disclose that the PPY:

> [A]gonists can comprise a polypeptide having a functional PYY domain, an active fragment of PYY, or a chemical or small molecule. PYY agonists may be peptide or non-peptide compounds, and include "PYY agonist analogs," which refer to any compound structurally similar to a PYY that have PYY activity typically by virtue of binding to or otherwise directly or indirectly interacting with a PYY receptor or other receptor or receptors with which PYY itself may interact to elicit a biological response. Such compounds include derivatives of

> PYY, extended PYY molecules having more than 36 amino acids, truncated PYY molecules having less than 36 amino acids, and substituted PYY molecules having one or more different amino acids, or any combination of the above. Such compounds may also be modified by processes such as amidation, glycosylation, acylation, sulfation, phosphorylation, acetylation and cyclization.

(Spec. 6: 3-13; *see also* Ans. 11; FF 4.)

FF 26. Appellants' Specification discloses that PYY agonists other than PYY and PYY[3-36] "can be identified" by using receptor binding assays known in the art or described in Appellants' Specification (Spec. 15: 3-5; *see also* published Spec. at ¶ [0050]).

FF 27. In the alternative Appellants' Specification discloses that "once one or more PYY-preferring (Y7) receptors have been characterized and cloned, alternative assays and high throughput screens can be implemented as discussed below or known in the art" (Spec. 15: 7-9; *see also* published Spec. at ¶ [0051]).

FF 28. Appellants' Specification discloses that "[t]he experiments relating to this invention should not, of course, be construed as specifically limiting the invention and such variations of the invention, now known or later developed, which would be within the purview of one skilled in the art are considered to fall within the scope of the invention as described herein and hereinafter claimed" (Spec. 16: 4-7; *see also* published Spec. at ¶ [0054]).

PRINCIPLES OF LAW

Enablement is a question of law, based on underlying findings of fact. *See, e.g., In re Wands*, 858 F.2d 731, 735 (Fed. Cir. 1988). Enablement "is

determined as of the application filing date." *In re Brana*, 51 F.3d 1560, 1567 n.19 (Fed. Cir. 1995).

"[T]o be enabling, the specification . . . must teach those skilled in the art how to make and use *the full scope of the claimed invention* without 'undue experimentation.'" *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993) (emphasis added), *quoted in Genentech, Inc. v. Novo Nordisk A/S,* 108 F.3d 1361, 1365 (Fed. Cir. 1997). Thus, "there must be sufficient disclosure, either through illustrative examples or terminology, to teach those of ordinary skill how to make and use the invention as broadly as it is claimed." *In re Vaeck*, 947 F.2d 488, 496 & n. 23 (Fed. Cir. 1991), *quoted in Enzo Biochem, Inc. v. Calgene, Inc.,* 188 F.3d 1362, 1374 (Fed. Cir. 1999). Some experimentation, even a considerable amount, is not "undue" if, e.g., it is merely routine, or if the specification provides a reasonable amount of guidance as to the direction in which the experimentation should proceed. *See In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988).

Arguments not made are waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

ANALYSIS

The claims have not been argued separately and therefore stand or fall together. 37 C.F.R. § 41.37(c)(1)(vii). Claim 43 is representative.

Based on the foregoing facts (FF 15-22) the Examiner concludes that "[d]ue to the complexity of the nature of PYY-related compounds, it is unpredictable whether a compound that is related to PYY would work in the same manner as that of PYY" (Ans. 9).

Appellants contend that the Specification provides:

> [A]mple direction and guidance, and ha[s] presented numerous examples of compounds that activate Y receptors within the context of the claimed pharmacological effects, such that it is well within the level of ordinary skill in the art to practice the invention without undue experimentation. *See* Specification, for example in paras. [0031]-[0033], Table 1, *etc*.

(App. Br. 11 (alteration and emphasis original); *see also* Reply Br. 2.) In this regard, Appellants contend that:

> The specification at paragraphs [0033] describe activity at various Y receptors along with Table 1, and paragraphs [0049]-[0053] generally describe screening assays. These teachings along with the literature cited throughout the specification, particularly in Table 1, establish that screening for activity at various receptors is routine in the art.

(App. Br. 12 (alteration and emphasis original); *see also* Reply Br. 2-3.) We are not persuaded.

We recognize Appellants' contention that "the claims are drawn to novel methods of using a class of PYY compounds" (App. Br. 11; *see also* Ans. 18). Claim 43 limits this class of PYY compounds to peptides. We recognize Appellants' contention that the PYY agonist analog required by the claimed method does "not have YP as its first two consecutive N-terminal amino acids" and that "compounds within the scope of the recited genus exhibit a specific pharmacological effect at particular[ ] Y receptors greater than PYY[1-36] at a Y1 receptor" (Reply Br. 3). Appellants' Specification defines this class of PYY peptide compounds as:

> any compound structurally similar to a PYY that have PYY activity typically by virtue of binding to or otherwise directly or indirectly interacting with a PYY receptor or other receptor or receptors with which PYY itself may interact to elicit a biological response. Such compounds include derivatives of

> PYY, extended PYY molecules having more than 36 amino acids, truncated PYY molecules having less than 36 amino acids, and substituted PYY molecules having one or more different amino acids, or any combination of the above. Such compounds may also be modified by processes such as amidation, glycosylation, acylation, sulfation, phosphorylation, acetylation and cyclization.

(FF 25; *see also* FF 4). Included in this class of PYY peptide compounds are those that do *not* bind or directly interact with a PYY receptor (*id.*).

Appellants' Specification discloses two compounds "PYY of SEQ ID NO: 2 and PYY(3-36) of SEQ ID NO: 3" (FF 16). Appellants' Specification discloses that other analogs may be obtained through the use of screening methodology (FF 26) or by waiting until those of ordinary skill in the art make other analogs available (FF 27 and 28). With respect to the latter we note that enablement "is determined as of the application filing date." *Brana*, 51 F.3d at 1567 n.19. Further, given the disclosure in Appellants' Specification (FF 27 and 28), we are not persuaded by Appellants' contention that "the claims are directed to novel methods of using a general class of *known* compounds" (Reply Br. 2 (emphasis original)).

With respect to Appellants' disclosure of screening methodology, the claimed method requires the use of a class of PYY analogs that includes members that do not bind or directly interact with a PYY receptor (FF 25; *see also* FF 4). Appellants contend that the screening methods disclosed in their Specification provide an enabling description of this broad class of PYY analogs that is sufficient to allow a person of ordinary skill in the art to practice the claimed method throughout its full scope, e.g., by using a PYY analog that neither binds nor directly interacts with a PYY receptor. The screening methodology, referred to in Appellants' Brief (*see* App. Br. 11-

12), makes use of receptor binding assays (FF 26; *see also* Ans. 17). Appellants contend that "[i]n the present claims, the recited pharmacological effect of PYY[1-36] at Y1 serves as . . . a comparator, and is compared to the corresponding pharmacological effect that is elicited by a recited PYY agonist analog at a Y2, Y5, or Y7 receptor" (Reply Br. 4). In addition, Appellants contend that "it has been found that PYY agonist analogs that have a preference for Y2, Y5 or Y7, with less of a preference for Y1, are active in reducing food intake" (Reply Br. 4). Appellants have not explained how the receptor binding assays or any other screening method disclosed in their Specification will identify a PYY analog that neither binds nor directly interacts with a PYY receptor (*see* FF 19).

For the foregoing reasons, we find no error in the Examiner's conclusion that Appellants' Specification "does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with the claims" (Ans. 4).

CONCLUSION OF LAW

Appellants failed to establish error in the Examiner's prima facie case of lack of enablement. The rejection of claim 43 under the enablement provision of 35 U.S.C. § 112, first paragraph, is affirmed. Claims 33, 44-46, 51, and 54-73 fall together with claim 43.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

alw

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